AMENDMENTS TO THE CLAIMS:

Please amend claims 6-10 and 12 and add newly written claims 15-17 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-5. (cancelled)

6. (currently amended) A swept frequency source comprising a phase-locked loop frequency synthesiser, the phase-locked loop including:

a voltage- controlled oscillator;

means for generating a first swept waveform;

means for modulating the voltage-controlled oscillator with the first swept frequency waveform added to a loop correction signal;

a reference frequency source;

a frequency/phase discriminator means for generating an output voltage which by means of a loop filter forms the loop correction signal so controlling the voltage-controlled oscillator, the frequency/phase discriminator means having a first input for receiving an input from the reference frequency source and a second input;

means ~~to generate~~for generating a lineariser IF signal whose frequency is in a predetermined relationship to the instantaneous output frequency of the voltage-controlled oscillator; and

feedback path means ~~further~~for feeding back the lineariser IF signal comprising:

an input for receiving the lineariser IF signal;

prescaler means for dividing the lineariser ~~intermediate frequency~~IF signal by a fixed number; and

a means ~~to apply~~for applying the prescaled lineariser IF signal to the second input of the frequency/phase discriminator means.

7. (currently amended) A swept frequency source as claimed in claim ~~1~~6 in which the swept frequency waveform comprises a linear ramp waveform arranged to generate a voltage-controlled oscillator output frequency whose frequency changes by equal increments in equal intervals of time, and in which frequency reference means provides a linear frequency ramp by means of ~~D~~direct ~~D~~digital ~~S~~synthesis the source further comprising:

means to repetitively generate digital words, each digital word representing the desired instantaneous amplitude of the prescaled lineariser IF at each respective predetermined instant of time;

accumulator means providing frequency words in an arithmetic progression, said accumulator means arranged to add an instantaneous frequency word with the cumulative sum of at least some of the immediately-preceding words to produce a digital sum phase word representing a new cumulative sum to which the next instantaneous value can be added; and

a cosine look-up table arranged to be addressed by at least part of the digital sum phase word, the look-up table output contributing to said reference frequency output via a low pass filter .

8. (currently amended) A swept frequency source as claimed in claim ~~1~~6, wherein the predetermined relationship between the voltage-controlled oscillator output frequency and the

lineariser IF signal frequency is achieved by means of down conversion by means of a mixer and a stable local ~~O~~oscillator.

9. (currently amended) A swept frequency source as claimed in claim ~~1~~6, wherein the predetermined relationship between the voltage-controlled oscillator output frequency and the lineariser IF signal frequency is achieved by means of frequency division by means of a prescaling frequency divider stage.

10. (currently amended) A swept frequency source as claimed in claim ~~1~~6, wherein a linearly ramping voltage generator for providing linear frequency ramp synthesis is operable to apply a modulation signal to the frequency control input of the voltage-controlled oscillator via a summer component.

11. (previously presented) A method of generating a swept frequency using a phase-locked loop frequency synthesiser comprising the steps of

(a) providing a phase-locked loop comprising a reference frequency source, a frequency/phase discriminator, a voltage-controlled oscillator, a prescaled lineariser IF signal whose frequency has a predetermined relationship to the output frequency of the voltage-controlled oscillator;

(b) modulating the voltage-controlled oscillator output frequency with a first modulating waveform;

(c) using the prescaled lineariser IF signal and the reference frequency source signal to produce a control signal whose instantaneous amplitude represents the phase difference between the prescaled lineariser IF signal and the reference frequency source signal;

(d) applying the control signal to a loop filter to provide an output signal; and

(e) summing said output signal with the first modulating waveform to control the voltage-controlled oscillator.

12. (currently amended) A method as claimed in claim 11, wherein the predetermined relationship between the voltage-controlled oscillator output frequency and the lineariser IF signal frequency is achieved by means of down conversion by means of a mixer and a stable local ~~O~~oscillator.

13. (previously presented) A method as claimed in claim 11, wherein the predetermined relationship between the voltage-controlled oscillator output frequency and the lineariser IF signal frequency is achieved by means of frequency division by means of a prescaling frequency divider stage.

14. (previously presented) A method as claimed in claim 11, further comprising the steps of generating a linearly ramping voltage using sweep waveform generating means in such a way as to apply a modulation signal to the frequency control input of the voltage-controlled oscillator via a summer component.

15. (new) A swept frequency source as claimed in claim 6, further comprising a high roll-off low pass filter for removing all digitally-generated alias components.

16. (new) A swept frequency source as claimed in claim 15, further comprising means for generating a direct current (dc) component, said dc component is a function of a frequency slip between the prescaled linerariser IF signal and the output of the high roll-off low pass filter.

17. (new) A swept frequency source as claimed in claim 6, further comprising a loop filter for limiting correction bandwith and for setting a damping factor of the loop for optimal noise performance.